REMARKS

Applicant appreciates the Examiner's response, in the second Office Action dated 17 September, 2008 (hereinafter "2nd Final Office Action"), to the arguments presented by Applicant in a reply dated 25 August 2008 (hereinafter "Applicant's Reply"). However, as explained in more detail below, the response in the 2nd Final Office Action is based on a continued misunderstanding of the teachings of the references and their applicability to the present inventions. The Applicant respectfully requests withdrawal of the present rejections and allowance of the pending claims in view of the arguments previously provided in Applicant's Reply, as well as the following comments. Although preferring to avoid the time and expense of an appeal, the Applicant is quite confident that the present claims are patentable over the cited references, and that this patentability has been amply demonstrated.

The 2nd Final Office Action's response to the Applicant's Reply focuses on selected details of Applicant's arguments but misses the essential point: <u>no combination of the cited Bottomley and Reznik references yields the presently claimed invention</u>. Whether or not Reznik's matrices include scalar values, neither Reznik nor Bottomley teaches or suggests a scalar value that represents <u>characterized or measured</u> inter-symbol interference (ISI) cancellation <u>performance</u> of an ISI cancelling receiver. As a result, it is obvious that neither Reznik nor Bottomley discloses the use of such a scalar value to scale an estimate of inter-symbol interference in a received signal, or the use of such a scaled estimate to in turn estimate received signal quality. Similarly, whether or not Reznik's hard or soft decision values might be used to compute signal quality, neither Bottomley nor Reznik teaches the estimation of received signal quality based on a scaled estimate of inter-symbol interference. All of these features, which are completely absent from Bottomley and Reznik, appear in each of the independent claims of the present invention. Thus, although Bottomley and Reznik are addressed to the general problem of

interference, their combination does not disclose or suggest anything that remotely resembles the presently claimed invention.

With regards to the particulars of the response in the 2nd Final Office Action, the Applicant first notes that it is irrelevant whether or not one skilled in the art "would know" that the hard and soft decisions discussed in Reznik "may be used to compute signal quality (SNR)," as alleged by the 2nd Final Office Action. The fact is that Reznik does not teach the computation of a signal-to-noise ratio (SNR) or any other signal quality metric from hard or soft decision values. More importantly, the present claims do not recite the computation of signal quality from hard or soft decision statistics. Rather, each of the present claims includes a feature directed to the estimation of received signal quality based on a scaled estimate of inter-symbol interference, which in turn is obtained by scaling an estimate of inter-symbol interference with a cancellation metric representing characterized or measured inter-symbol interference cancellation performance of the receiver. Thus, even if Reznik expressly taught the calculation of SNR from hard or soft decision statistics it nonetheless would fall far short of disclosing or suggesting the features of the present claims. Accordingly, since the 2nd Final Office Action admits that the combination of Bottomley and Reznik "fail[s] to explicitly teach estimating the received signal quality based on the scaled estimate of inter-symbol interference," and since Reznik does not "suggest" such a feature, all of the pending rejections are improper, and should be withdrawn for at least this reason alone.

Similarly, it is also irrelevant whether or not Reznik's "Matrix O is comprised of scalar values," as asserted by the 2nd Final Office Action at page 3. The point is that Reznik's equation (10) shows only that a residual interference vector $\vec{c}(m)$ is subtracted from a received signal vector $\vec{y}$, and that the result is multiplied by a matrix S. Regardless of whether one skilled in the art would

understand the matrix multiplication in Reznik's equation (10) to disclose the claimed "scaling by a scalar value," Reznik's matrix S is not used to scale an estimate of inter-symbol interference in the received signal, as claimed in the present invention. $\vec{y}$ is the received symbol, not an estimate of inter-symbol interference. $\vec{c}(m)$ is a *residual* interference vector that remains *after* ISI has been canceled. Neither element is the claimed "estimate of inter-symbol interference in the received signal." Nor is the difference between these elements an estimate of ISI.

Perhaps more importantly, matrix S is not (and does not include) "a scalar value representing characterized or measured inter-symbol interference cancellation performance of the receiver," as claimed in the present application. On this point, the 2nd Final Office Action argues:

> *ISI cancellation performance in the receiver is dependent on Matrix S, which further depends on Matrix A. (See fig. 9) And Matrix A is computed based on channel estimates calculated at the receiver, and it contains information about intersymbol interference present in the received data signal. (See fig. 8 & ¶ 67) Furthermore, Reznik does teach that the system arquitecture [sic] delegates the cancellation of ISI to the direct interference canceller.*

(Office Action, pp. 3-4.) This can only be understood to say that matrix S is somehow related to intersymbol interference, and that ISI cancellation performance depends on matrix S. In other words, the 2nd Final Office Action appears to be saying simply that matrix S *determines*, or *has an effect on*, the cancellation performance of the receiver. Thus, matrix S is an *input* to the cancellation performance of the receiver. Of course, this is effectively the *opposite* of what the present claims recite: a value that represents characterized or measured ISI cancellation performance of the receiver, i.e., a metric related to the *output* of the cancellation process. As Applicant has previously noted, Reznik is utterly silent with respect to ISI cancellation

performance of a receiver. And Reznik certainly has nothing to say with respect to characterizing or measuring such performance. Thus, Reznik's equation (10) has absolutely nothing to do with a scalar value representing characterized or measured inter-symbol interference cancellation performance of the receiver.

The Applicant appreciates that the subject matter of the present application and the cited references is complex, necessitating lengthy Office Actions and replies. However, the Applicant submits that large distinctions between the present claims and the cited references have been repeatedly demonstrated, and that this fourth Office Action comes no closer than the first to demonstrating unpatentability of the claims. In view of the above comments and the previously made arguments, Applicant respectfully requests withdrawal of the pending rejections and allowance of the claims.

Respectfully submitted,

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